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PROVISIONAL SPECIFICATION.

Improvements in the Production of Non-alcoholic Ales or Beers.

I AMOS HERBERT HOBSON, of 9 Victoria Street, London S.W. Analytical Chemist do hereby declare the nature of this invention to be as follows :—

The object of this invention is to produce from malt, or malt and some partial substitute such as unmalted grain, and hops a beverage similar to ordinary brewers' ales or beers but non-alcoholic and without the addition of extraneous preservatives or chemicals such as salicylic acid or other similarly acting substitutes.

In order that ordinary vinous fermentation may take place, three constituents of the liquor are necessary; nitrogenous organic matter, carbo-hydrates, and phosphatic salts.

10 In order to produce the new non-alcoholic ale, the nitrogenous organic matter is as far as possible eliminated so that little, if any, fermentation, can take place in the liquor.

This elimination of nitrogenous organic matter is effected by mashing within the usual limits of temperature but by keeping the liquid at some multiple of its
15 finished strength, say four to six times, by not boiling the wort but only heating to 212° and immediately stopping the heat, then (after cooling or not but preferably after cooling with through admission of air) straining the wort through the spent hops which have been previously boiled separately in such a manner as to extract nearly all the tannin, then running the infusion of hops through the spent hops to
20 wash out the wort, then mixing the hot infusion with the wort and concentrating, then cooling the liquid to 60° or so, in an open vessel and stirring at the strength aforesaid (the concentration if necessary by heat not above 160° F.) and filtering.

The liquid is then to be diluted with pure water and aerated, preferably by liquid carbonic acid gas.

25 The essential features of this process are—

Using concentrated wort.

Passing the wort through separately-boiled spent hops, obtaining as much tannin as possible, not boiling the wort.

30 Evaporating at a comparatively low temperature, and cooling as low as possible before filtering.

Dated April 22nd 1892.

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COMPLETE SPECIFICATION.

Improvements in the Production of Non-alcoholic Ales or Beers.

I, AMOS HERBERT HOBSON of 9, Victoria Street, London, S.W., Analytical Chemist, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the
40 following statement :—

The object of this invention is to produce from malt (or malt and some partial substitute such as unmalted grain) and hops a beverage similar, so far as taste and appearance are concerned, to ordinary brewers' ales or beers, but which is non-alcoholic and yet does not need for its preservation the addition of salicylic acid,

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sulphurous acid or its compounds, or other substances which are more or less injurious to health.

In order that ordinary vinous fermentation of a wort may take place, three constituents are necessary *viz.* nitrogenous organic matter, carbo-hydrates, and phosphatic salts, and therefore in order to produce my new non-alcoholic ale the operation is so conducted that the proportion of nitrogenous organic matter (which exists in brewers' wort in very small proportion, yet sufficient for the production of a large proportion of alcohol) is so much reduced that little, if any, fermentation can take place in the liquor.

My invention comprises the following essential features, *viz.* :—The use of concentrated wort; not boiling the wort; passing the wort through spent hops; concentrating at a low temperature; cooling the wort before filtering; and the process is carried out as follows—

A decoction or infusion of malt (or malt and some partial substitute) is prepared by mashing in the usual way, except that the liquid is maintained at a specific gravity or strength exceeding by three times or more that of the finished beverage, the object throughout the process of working with concentrated liquors being to prevent, as far as possible, the nitrogenous organic matters entering into solution and so enable them to be removed by filtration with a view to prevent fermentation taking place.

The temperature of the liquid at the termination of the mashing operation is raised to a point (say 88° C.) sufficient to arrest the diastatic action of the malt, and it is maintained at this point for a period sufficient to effect this result, care being taken that the temperature does not rise to the boiling point. The wort is then drawn off and strained through separately-boiled spent hops, that is to say hops from which as much as possible of the tannin, the hop bitter, and other constituents valuable for making beer have been extracted by boiling the hops in water. The purpose of straining the wort through the spent hops is to filter the wort and at same time to utilize the undissolved tannin still contained in the hops, for the purpose of aiding in precipitating out part of the dissolved nitrogenous organic matter contained in the wort. If the wort be hot when passed through the hops, the filtration through the hops is more rapidly effected but the result is that a little more nitrogenous matter goes into solution than if the wort were cooled before being strained through the hops.

The portion of the wort which is retained by the spent hops after this operation may be removed either by washing the same out with water or with part of the previously-made aqueous infusion or extract of hops which may then be added to the wort. The aqueous hop-extract is then preferably partially concentrated, and in its concentrated or unconcentrated condition is added to the wort and the mixture is then concentrated, at as low a temperature as possible and in any case below 100° C. until the mixture acquires a specific gravity or strength three or more times that which the finished beverage is to possess, the mixture being well stirred during the operation. The liquid is then cooled down to a temperature of about 1° C. to 16° C., and filtered through an ordinary filter-press, using cloths known as swans down (or filter-paper) which retains the muddy sediment which is largely composed of organic nitrogenous matter, and which itself acts as an efficient filtering medium so that the filtrate comes off bright and clear. To this liquor pure water is then added, the quantity of water depending on the strength or gravity of the beverage to be produced. The beverage may, if desirable, be aerated by liquefied or other carbonic acid gas in the usual manner.

The relative proportions of the malt and hops used in the manufacture of this non-alcoholic beer may be the same as in brewing ordinary alcoholic beers. By non-alcoholic I would not have it necessarily understood to mean a beer absolutely free from alcohol although I can produce by this process a beer practically free from alcohol as well as beer containing an appreciable proportion of alcohol but which yet come well within the Excise definition of a non-alcoholic beverage.

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Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The herein described process of manufacturing a non-alcoholic beverage which consists essentially in heating the wort obtained from a strong mash to a temperature sufficient to arrest the diastatic action of the malt without however boiling the wort, then straining the wort through spent hops in order to precipitate out nitrogenous organic matter, adding the previously obtained hop infusion or extract to the wort, concentrating at a low temperature, then cooling and filtering the liquid, and finally adding water to reduce the strength to that required for a beverage, the whole operation being carried out substantially in the manner specified.

2. In a process of making beer such as herein described, heating the strong wort separately from the hops, to a degree sufficient to arrest the diastatic action of the malt but without boiling the wort, as specified.

3. In the herein described process of making beer, concentrating at a comparatively low temperature the mixed wort and hop extract and filtering the same at a low temperature, as specified.

4. The herein described non-alcoholic beverage made from malt (or malt and some partial substitute such as unmalted grain) and hops, substantially in the manner specified.

Dated this 23rd day of January 1893.

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